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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/562,578 | 12/27/2005 | Yasuharu Onishi | Q92252 | 7872 |
| 23373 7590 07/09/2007 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | EXAMINER ROSENAU, DEREK JOHN | |
| | | | ART UNIT 2834 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/562,578 | Applicant(s) ONISHI ET AL. | |
| | Examiner Derek J. Rosenau | Art Unit 2834 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>12/27/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the subject matter of claim 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. Figures 1A and 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected

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drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 31a, 4, 32, 35e, 13f'. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 31, 4c, 22c, 1e, 35, 2, 10, 104b, 121b, 122b, 121c, 101e, 103e, 121e, 101f, 1105a', 1101a', 134f', and 66. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the

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description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The disclosure is objected to because of the following informalities. At page 26, line 19, it appears that the reference numeral 33d' was intended to be 133d'. At page 31, line 19, it appears that "65 a" was intended to simply be "65."

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3, 6-8, 10, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang (US 6359370).

9. With respect to claim 1, Chang discloses a piezo-electric actuator (Fig 1) comprising: a piezo-electric element (item 106) having a piezo-electric body which is provided with at least two opposing surfaces (Fig 1), wherein the surfaces perform an expanding and contracting motion in accordance with a state of an electric field (column 3, lines 30-51); a constraint member (center of cruciform base 104) for constraining the piezo-electric element on at least one of the two sides, a supporting member (item 102) disposed around the constraint member, and a plurality of beam members (item 104) each having both ends that are fixed to the constraint member and the supporting member, respectively (Fig 1), wherein each beam member has a neutral axis for bending in a direction substantially parallel with the constrained surface (Fig 12 and column 6, lines 4-26), wherein the constraint member vibrates by vibration which is generated by constraining effect between the constraint member and the piezo-electric element, and is amplified by the beam members (inherent to the structure).

10. With respect to claim 2, Chang discloses the piezo-electric actuator according to claim 1, wherein said beam members are straight beams (Fig 1).

11. With respect to claim 3, Chang discloses the piezo-electric actuator according to claim 1, wherein said constraint member has a base (center of cruciform base 104) for constraining said piezo-electric element, and a plurality of arms (item 104) that extend from said base to constitute said beam members (Fig 1).

12. With respect to claim 6, Chang discloses the piezo-electric actuator according to claim 1, wherein said piezo-electric element is provided with an insulating layer (item 104) on at least one of said two surfaces.

13. With respect to claim 7, Chang discloses the piezo-electric actuator according to claim 1, wherein said piezo-electric element has a rectangular parallelepiped shape (Fig 1).

14. With respect to claim 8, Chang discloses an acoustic element comprising: the piezo-electric actuator according to claim 1; and a vibrating film (item 104) coupled to said piezo-electric actuator (Fig 1) for radiating sound through vibration that is transmitted from said piezo-electric actuator. The movement of the piezo-electric element would generate "sound" in that it would generate pressure waves in the air surrounding it.

15. With respect to claims 10 and 11, Chang discloses the piezo-electric actuator according to claims 1 and 8 respectively; therefore, Chang discloses an electronic device comprising these actuators, as piezo-electric actuators are electronic devices.

16. Claims 1-4, 7, 8, 10, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii et al. (US 20020149296).

17. With respect to claim 1, Fujii et al. discloses a piezo-electric actuator (Fig 1) comprising: a piezo-electric element (item 2) having a piezo-electric body which is provided with at least two opposing surfaces (Fig 1), wherein the surfaces perform an expanding and contracting motion in accordance with a state of an electric field (Paragraph 67); a constraint member (item 3) for constraining the piezo-electric element on at least one of the two sides, a supporting member (Fig 16, item 31) disposed around the constraint member, and a plurality of beam members (Fig 16, portion of metal thin plate 1 that extends from the piezo-electric element to the support member) each having both ends that are fixed to the constraint member and the supporting member, respectively (Fig 16), wherein each beam member has a neutral axis for bending in a direction substantially parallel with the constrained surface (Paragraph 67), wherein the constraint member vibrates by vibration which is generated by constraining effect between the constraint member and the piezo-electric element, and is amplified by the beam members (inherent to the structure).

18. With respect to claim 2, Fujii et al. discloses the piezo-electric actuator according to claim 1, wherein said beam members are straight beams (Fig 16).

19. With respect to claim 3, Fujii et al. discloses the piezo-electric actuator according to claim 1, wherein said constraint member has a base (item 1) for constraining said piezo-electric element, and a plurality of arms (Fig 16, portion of metallic thin plate 1 that extend from the piezo-electric element to the supporting member) that extend from said base to constitute said beam members (Fig 16).

20. With respect to claim 4, Fujii et al. discloses the piezo-electric actuator according to claim 1, wherein said constraint member is a second piezo-electric element (item 3) which differs in vibrating direction from said piezo-electric body (Paragraph 67)

21. With respect to claim 7, Fujii et al. discloses the piezo-electric actuator according to claim 1, wherein said piezo-electric element has a rectangular parallelepiped shape (Fig 16).

22. With respect to claim 8, Fujii et al. discloses an acoustic element comprising: the piezo-electric actuator according to claim 1; and a vibrating film (item 1) coupled to said piezo-electric actuator (Fig 16) for radiating sound through vibration that is transmitted from said piezo-electric actuator. The movement of the piezo-electric element would generate "sound" in that it would generate pressure waves in the medium surrounding it.

23. With respect to claim 10 and 11, Fujii et al. discloses the piezo-electric actuator according to claims 1 and 8 respectively; therefore, Fujii et al. discloses an electronic device comprising these actuators, as piezo-electric actuators are electronic devices.

24. Claims 1, 3, 6, 8, and 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogura et al. (US 6453050).

25. With respect to claim 1, Ogura et al. discloses a piezo-electric actuator (Fig 1, 3A, 3B, 4, 5) comprising: a piezo-electric element (item 3, 13, 3a-3i) having a piezo-electric body which is provided with at least two opposing surfaces (Fig 2A), wherein the surfaces perform an expanding and contracting motion in accordance with a state of an electric field (column 9, lines 20-25); a constraint member (items 14, 4a-4d) for constraining the piezo-electric element on at least one of the two sides, a supporting

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member (12, 2b) disposed around the constraint member, and a plurality of beam members (5a-5h, 16a-16d) each having both ends that are fixed to the constraint member and the supporting member, respectively (Fig 1, 3A, 3B, 4, 5), wherein each beam member has a neutral axis for bending in a direction substantially parallel with the constrained surface (column 2, lines 7-13), wherein the constraint member vibrates by vibration which is generated by constraining effect between the constraint member and the piezo-electric element, and is amplified by the beam members (inherent to the structure).

26. With respect to claim 3, Okura et al. discloses the piezo-electric actuator according to claim 1, wherein said constraint member has a base (items 14, 4a-4d) for constraining said piezo-electric element, and a plurality of arms (items 5a-5h, 16a-16d) that extend from said base to constitute said beam members (Fig 1, 3A, 3B, 4, 5).

27. With respect to claim 6, Okura et al. discloses the piezo-electric actuator according to claim 1, wherein said piezo-electric element is provided with an insulating layer (items 14, 4a-4d) on at least one of said two surfaces.

28. With respect to claim 8, Okura et al. discloses an acoustic element comprising: the piezo-electric actuator according to claim 1; and a vibrating film (items 14, 4a-4d) coupled to said piezo-electric actuator (Fig 1, 3A, 3B, 4, 5) for radiating sound through vibration that is transmitted from said piezo-electric actuator (column 2, lines 7-13).

29. With respect to claim 12, Okura et al. discloses an acoustic apparatus comprising a plurality of said acoustic elements according to claim 8 which have resonance

frequencies different from each other for smoothing frequency response of sound pressure (column 11, lines 62-64).

30. With respect to claims 10, 11, and 13, Ogura et al. discloses the piezo-electric actuator according to claims 1, 8, and 12 respectively; therefore, Fujii et al. discloses an electronic device comprising these actuators, as piezo-electric actuators are electronic devices.

Claim Rejections - 35 USC § 103

31. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

32. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang, Fujii et al., or Ogura et al. in view of Sasaki et al. (US 7067965).

33. With respect to claim 5, Chang, Fujii et al., and Ogura et al. each disclose the piezo-electric actuator according to claim 1.

None of Chang, Fujii et al., or Ogura et al. discloses expressly that said piezo-electric element comprises a plurality of said piezo-electric bodies and a plurality of electrode layers for applying an electric field to said piezo-electric bodies, wherein each piezo-electric body and each electrode layer is alternately laminated.

Sasaki et al. teaches a piezo-electric actuator in which the piezo-electric element comprises a plurality of said piezo-electric bodies and a plurality of electrode layers for

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applying an electric field to said piezo-electric bodies, wherein each piezo-electric body and each electrode layer is alternately laminated (Fig 3).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the stacked piezo-electric element of Sasaki et al. with the piezo-electric actuators of Chang, Fujii et al., or Ogura et al. for the benefit of allowing for larger displacements (column 1, lines 37-42).

34. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang, Fujii et al., or Ogura et al. in view of Toki (US 5856956).

35. With respect to claim 9, Chang, Fujii et al., and Ogura et al. each disclose the piezo-electric actuator according to claim 8.

None of Chang, Fujii et al., or Ogura et al. discloses expressly a vibration transmitting member sandwiched between said piezo-electric actuator and said vibrating film.

Toki teaches a piezo-electric speaker device that includes a vibration transmitting member (item 46) sandwiched between a piezo-electric actuator (item 47) and a vibrating film (item 42).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the vibration transmitting member of Toki with the piezo-electric actuators of Chang, Fujii et al., or Ogura et al. for the benefit of creating a device in which the diaphragm itself need not be distorted (column 5, lines 53-58 of Toki).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is 571-272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek J Rosenau
Examiner
Art Unit 2834

DJR
6/29/2007


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